COMMENTS

AN INTERNATIONAL APPROACH TO THE GREENHOUSE EFFECT: THE PROBLEM OF INCREASED ATMOSPHERIC CARBON DIOXIDE CAN BE APPROACHED BY AN INNOVATIVE INTERNATIONAL AGREEMENT

> Today's environmental problems are closely interlinked, planetary in scale and deadly serious. They cannot be addressed issue by issue or by one nation or even by a small group of nations acting alone.[1]

The current environmental crisis of increasing carbon dioxide in the atmosphere has global ramifications. The problem must be confronted with both preventative[2] and reductive[3] measures. The world as a community must address the issue of the environment from both the industrial nations' view-point and from the developing countries' view-point. These divergent views occur because of differing priorities among the various nations. Integrating these two divergent points of view is crucial. Despite these differences, both have similar needs. All countries require a clean and healthy environment in order to continue to progress.

This Comment explores the problem of increasing carbon dioxide in the atmosphere. The question is whether or not the problem of increasing carbon dioxide can be controlled through an international agreement similar to the agreement to control the destruction

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1. Speth, *Dedicate the '90s to the Environment*, L.A. Times, Feb. 16, 1989, § II at 17, cols. b & c.

2. Measures taken to prevent the emission of carbon dioxide into the atmosphere. For example, the use of alternative fuels which are not made of carbon. Johnston, *Systematic Environmental Damage: The Challenge to International Law and Organization*, 12 SYRACUSE J. INT'L L. & COMM. 255-82, 257 (1985).

3. Measures taken to reduce the emission of carbon dioxide which is currently occurring. For example, increasing emission controls on all American automobiles, not just those in California. Weiss, *A Resource Management Approach to Carbon Dioxide During the Century of Transition*, 10 DEN. J. INT'L L. & POL'Y 487, 501 (1981).

of the ozone layer of the stratosphere. First, the author discusses the carbon dioxide problem and its effect on the earth. Then, the evolution of international environmental law including the innovative Montreal Protocol[4] is considered. Third, the problem of increased carbon dioxide is compared with the ozone problem because they have similar global impacts. That comparison shows that an agreement similar to the Montreal Protocol is possible. Finally, the author offers several proposals that should be included in any international agreement to resolve the carbon dioxide dilemma.

I. THE GREENHOUSE EFFECT

A. Description of the Carbon Dioxide Problem

The greenhouse effect refers to the gradual warming of the earth's atmosphere. The atmosphere contains radioactive gases[5] which prevent heat from escaping into the solar system,[6] thereby raising the earth's temperature. Sunlight is absorbed by the earth and converted into heat.[7] The heat then rises, striking the molecules of gas, causing them to vibrate and then is reflected back to earth.[8] The more gas in the atmosphere, the more heat is reflected back to earth.

Carbon dioxide emissions occur naturally in the environment. They are the result of any organism's physiological process, natural fires, or the eruption of a volcano. Without interference from man, the earth managed to maintain a fairly constant level of carbon dioxide and therefore a fairly constant level of heat.[9] But man increased the emission of carbon dioxide by the massive burning of fossil fuels (coal, wood, gas) and anything that is made of carbon. Once the Industrial Revolution began (circa 1840-1850), man started emitting more and more carbon dioxide into the atmo-

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4. Protocol on Substances that Deplete the Ozone Layer, Sept. 16, 1987, 26 I.L.M. 1541 [hereinafter Montreal Protocol].

5. The gases include water vapor, carbon dioxide and ozone. They have the ability to intercept infrared radiation, preventing the escape of heat into the atmosphere. Without this greenhouse effect, the earth's surface would cool and the planet would be covered with ice. However, too many of these gases prevent the escape of heat that is necessary to prevent the earth's surface from becoming too warm. Ramanathan, *The Greenhouse Theory of Climate Change: A Test by an Inadvertent Global Experiment*, SCIENCE, Apr. 15, 1988, at 294.

6. Weiss, *supra* note 3, at 489.

7. Ramanathan, *supra* note 5, at 294.

8. *Id.* at 293.

9. *Inside the Greenhouse: Heat Waves*, NEWSWEEK July 11, 1988, at 19 [hereinafter *Heat Waves*].

sphere.[10] Since measurements began, the level of carbon dioxide has increased by twenty-five percent.[11]

Whether or not the greenhouse effect has taken place was formally a topic of debate among the world's scientists.[12] Recently, the nature of the debate changed. Most environmentalists agree that it is occurring.[13] The debate now centers around when it will happen and exactly what effect it will have.[14]

Since scientists began measuring the mean global temperature over a hundred years ago, 1987 was the warmest year on record.[15] The first five months of 1988 were the warmest on record,[16] and the 1980s is the warmest decade in a century.[17] In July 1988, the U.S. Congress recognized the greenhouse effect in several proposed bills.[18] Scientists warning of the greenhouse effect feel that a rise in the earth's temperature of at least two or three degrees Fahrenheit seems inevitable by the mid-twenty-first century. By then, the concentration of carbon dioxide in the atmosphere is likely to be at least sixty percent greater than it is today and one hundred percent greater than the level that existed before the Industrial

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10. *The Global Greenhouse Finally has Leaders Sweating*, BUSINESS WEEK, Aug. 1, 1988, at 74 [hereinafter *The Global Greenhouse*].

11. Ramanathan, *supra* note 5, at 293-94. The greenhouse effect was first discussed in 1896. In the 1930s it was concluded that human activities were affecting the level of carbon dioxide in the atmosphere. In 1967 quantitative results were produced showing that the carbon dioxide induced global warming. The conclusions of these studies can be summarized as follows: (1) the observed increases in trace gas concentrations from the mid-nineteenth century to the present have significantly increased the radiative heating of the surface and atmosphere; (2) there will be a severe reduction of the upper stratosphere and a cooling of the mid-to-upper stratosphere and warming of the surface and troposphere; and (3) if the observed decadal trace gas growth rate continues unabated, the cumulative surface warming would, in the next two decades, become large enough to manifest itself unambiguously in the global temperature records. For an interesting discussion of this phenomenon, *see also* Telempath, by Spider Robinson, an excellent science fiction novel.

12. Weiss, *supra* note 3, at 488. However, at the close of the Helsinki meeting, West Germany's Environment Minister Klaus Topfer declared that the next urgent task is to put limits on the emission of carbon dioxide and methane. TIME, May 15, 1989, at 63.

13. Lemonick, *Feeling the Heat*, 133 TIME, Jan. 2, 1989, at 36.

14. *Id.* For example, some scientists predict that the atmosphere may warm up 3 to 8 degrees Fahrenheit by the middle of the next century.

15. Monastersky, *Has the Greenhouse Taken Effect?* SCIENCE NEWS, Apr. 30, 1988, at 282. The temperature in 1987 was 0.05 degrees celsius warmer than 1981 and 1983 which tied for second; 1980 was in fourth place and 1986 was in fifth place.

16. *Heat Waves*, *supra* note 9, at 18. Since 1980, the mean global temperature has risen more than one degree fahrenheit. Compared to the thirty-year period ending in 1980, the mean has gone up just under one degree in the last year and a half alone.

17. Monastersky, *supra* note 15, at 282.

18. S. 2663, 100 Cong., 2d Sess. (1988); S. 2666, S. 2667, 100 Cong., 2d Sess. (1988); H. 5380, 100 Cong., 2d Sess. (1988); H. 5460, 100 Cong., 2d Sess. (1988); H. Con. Res 389, 100 Cong., 100 Sess. (1988). All bills essentially proposed that the U.S. develop a national policy and enter into international agreements to mitigate global warming from the greenhouse effect.

Revolution.[19]

Just a two-degree warming could have dramatic effects on the earth's climate. Critical elements such as rainfall, wind, cloud cover, ocean currents, sea levels, growing seasons and polar ice caps would be affected.[20] Many experts agree that the levels of some rivers would fall; some of the world's most productive farm lands could become like the "dust bowls" of the 1930s; and, some of the most arid lands might get more rainfall, causing floods and erosion.[21] While there might be an occasional positive effect, such as the lengthening of some short growing seasons, scientists feel that even a short-term positive effect of the greenhouse effect would ultimately have a negative impact.[22] Stephen Schneider of the National Center for Atmospheric Research warned, "[e]cosystems will not be able to adjust so quickly, and the faster things change, the more likely it is that the impact will be negative."[23]

The solution to the greenhouse effect is simple to articulate: (1) stop the burning of fossil fuels, (2) stop the destruction of the world's rain forests, and (3) replant those areas that have already been destroyed. The difficult part is in accomplishing these three steps.

B. Decrease the Burning of Fossil Fuels

Carbon dioxide emanates from many sources: every fuel stack, every car, and, every human being produces carbon dioxide.[24] The United States, Soviet Union, Eastern Europe and Western Europe together produce seventy percent of all the carbon dioxide,[25] while the United States and Western Europe alone produce forty-five percent.[26]

The world must become more energy efficient, changing from the burning of oil and coal to other sources. The following alternatives

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19. NATIONAL RESEARCH COUNCIL, AD HOC STUDY GROUP ON CARBON DIOXIDE AND CLIMATE, CARBON DIOXIDE AND CLIMATE: A SCIENTIFIC ASSESSMENT (1979).

20. STAFF OF SENATE COMMITTEE ON GOVERNMENTAL AFFAIRS, 96TH CONG., 1ST SESS., REPORT ON CARBON DIOXIDE ACCUMULATION IN THE ATMOSPHERE, SYNTHETIC FUELS AND ENERGY POLICY 78 (Comm. Print 1979) [hereinafter Report on Carbon Dioxide]; Ramirez, *A Warming World: What it Will Mean*, FORTUNE, July 4, 1988, at 103.

21. Report on Carbon Dioxide, *supra* note 20.

22. Ramirez, *supra* note 20, at 103. The Soviet Union's growing season would be lengthened by forty days, but more droughts would require extensive irrigation projects. Also in China, marginal farmland in central areas might get more rain lifting yields.

23. *Feeling the Heat*, TIME, Jan. 2, 1989, at 36-37.

24. *Heat Waves*, *supra* note 9, at 16.

25. Weiss, *supra* note 3, at 491.

26. *Id.*

would be helpful in decreasing the amount of carbon dioxide emissions into the atmosphere.

1. Solar Power—Solar power includes wind and hydroelectric power. It is generated by the collection of energy in large solar cells, windmills, and the collection of water behind dams. The difficulty with solar power is that it can be generated at relatively few sites and the collection process itself causes warming.[27]

2. Natural Gas—Natural gas produces about half as much carbon dioxide as coal and about two-thirds that of oil for the same amount of energy.[28] Reserves of natural gas are abundant in most areas of the world.[29] In addition, the cost of building a power plant which uses natural gas is only about one twentieth that of a coal burning facility.[30]

3. Alternative Fuels—Fuels such as methane, ethanol, and hydrogen are currently being developed for use in automobiles.[31] Hydrogen is one of the highest-quality fuels available because it combines with oxygen to form a water vapor as it burns.[32]

4. Geothermal Power—There are vast, natural reserves of heat just beneath the surface of the earth.[33] More research needs to be done on how to trap this resource and make it useable.[34] Currently, several fields are being utilized in California to produce electricity. However, the output remains minor in terms of the total production

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27. O'Neill, *Solar Power by Satellite Would Solve Ozone Crisis*, L.A. Times, Mar. 7, 1989, § II, at 7, col. 5.

28. Ramirez, *supra* note 20, at 107. This is admittedly an interim step but could extend by twenty to thirty years the time it takes form atmospheric CO_2 to double from preindustrial levels.

29. *Id.*

30. *The Global Greenhouse*, *supra* note 10, at 75. It costs $600 to $700 per kilowatt to build a new gas-fired plant versus $12,000 to $15,000 per kilowatt to build a coal-fired plant.

31. Keating, *Road to Power*, OMNI, June 1989, at 66, 68-72. Hydrogen exists in nature and is abundant. It can be extracted in a number of ways: separation from natural gas, by passing electricity through water, separating the molecules, and from plants and waste materials. Research is being done in the U.S., but more is being done in the Soviet Union, Canada, and West Germany.

32. *Id.* at 72. The major drawback is the cost of producing it. Another drawback is combustibility. The dirigible, the Hindenburg, was fueled by hydrogen. It caught fire as it approached a docking station with a resulting 58 deaths. However, several nations are exploring the use of hydrogen as rocket fuel in aerospace planes.

33. R. CARLSON, THE ECONOMICS OF GEOTHERMAL POWER IN CALIFORNIA 2-5 (1979). This heat is often seen as geysers; however, there is a large quantity of heat under the surface. There are two types of geothermal power: nonvolcanic regions which overlie deep-seated magma bodies and volcanic areas. Both types of areas occur in California. The California Energy Commission adopted a Geothermal Policy Report in 1978.

34. CONGRESSIONAL INDEX, 1987-1988. H-235. In January 1987, Rep. Quillen (R - Tenn.) introduced a bill to create a commission to grant exclusive franchises for exploration for the commercial development of geothermal energy, and the right to market any such energy in this natural state. No Senate bill was introduced.

of energy.[35]

5. Nuclear Power—Nuclear power produces no carbon dioxide.[36] Of course, the chance of another nuclear accident, such as Chernobyl[37] or Three Mile Island,[38] is always a possibility and uppermost in most of the public's mind. However, even some hard core environmentalists are beginning to espouse the exploration of safer nuclear power.[39]

6. Efficiency—Improved efficiency of fuel users such as automobiles and major electric appliances would have the effect of producing less carbon dioxide. In the past fifteen years, cars have become twenty-five percent more efficient, but there is great room for improvement.[40] In 1989, the U.S. passed a law adopting efficiency standards for everything from lighting to air conditioners and freezers.[41]

C. Deforestation and Reforestation

Trees are among the most efficient absorbers of carbon dioxide,[42] but they are systematically being felled around the world at the rate of one-hundred forty-four million to two-hundred forty million acres each year.[43] To fuel their economies, Third World countries like Brazil, West Africa, and Indonesia are cutting their forests to develop agricultural land,[44] to export the wood, and for fuel.[45] This

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35. GILBRETH, GOVERNING GEOTHERMAL STEAM 106-07 (1979).

36. *The Global Greenhouse*, *supra* note 10, at 75.

37. Nuclear power accident that occurred in Chernobyl, USSR in 1986.

38. Nuclear power accident that occurred at the Three Mile Island Nuclear Power Plant in Pennsylvania on March 28, 1979.

39. S. 2639, 100 Cong., 2d Sess. (1988); H. 5040 100 Cong., 2d Sess. (1988). Sen. John McCain (R-Ariz.) and Rep. Morris Udall (D-Ariz.) introduced a bill that would direct the Energy Dept. to develop prototype next-generation reactors with safety features that could be licensed quickly. Edward M. Davis, president of the American Nuclear Energy Council stated, "[t]he greenhouse effect has made nuclear power respectable again in political circles." *The Global Greenhouse*, *supra* note 10, at 75.

40. Auto makers have prototypes of engines that deliver far greater economy: Citroen has an engine that tops 80 miles per gallon; Toyota has a prototype that gets 128 miles per gallon at 38 miles per hour. *The Global Greenhouse*, *supra* note 10, at 75.

41. National Appliance Energy Conservation Act, Pub.L. No. 100-12, 101 Stat. 103 (1987). These standards are expected to save about 30,000 megawatts of energy in the year 2000 as new, more efficient products come on the market. The Rocky Mountain Institute has prototypes of refrigerators, and freezers that use less than 15% energy than today's models do. *The Global Greenhouse*, *supra* note 10, at 75.

42. *Heat Waves*, *supra* note 9, at 20.

43. *Environmental Perspective*, U.N. MONTHLY CHRON., Mar. 1988, at 39. *Reforestation Would Curb Global Warming*, INT'L ENV'TL RPTR., May 11, 1988, at 289 [hereinafter *Reforestation*].

44. *The Death of Birth*, TIME, Jan. 2, 1989, at 32. The soil that supported a rich rain forest is not suited to produce corn and other crops. Most of the land quickly becomes depleted of the required nutrients, requiring the settlers to move on and destroy another piece

is a double assault on the carbon dioxide problem: the removal of carbon dioxide users and the production of more carbon dioxide. However, developing countries are beginning to realize the importance of protecting their forests.[46] They are beginning to balance the economic benefits against the environmental effects.

In 1988, the Worldwatch Institute[47] encouraged the planting of 321 million acres of land by the year 2000.[48] The cost of such an effort in 23 "desperate" countries was estimated at eight billion dollars.[49] The planting of trees would also curb soil erosion, drought, floods and chronic fuel shortages.[50]

Another development, the Brundtland Commission Report, was presented to the General Assembly of the United Nations in early 1988.[51] This document was prepared to guide Governments in helping to achieve environmentally-sound development.[52] One of the primary recommendations was for reforestation.[53]

The problem of increasing carbon dioxide does not just involve the United States, it involves the entire world and every inhabitant.[54] Therefore, any solution will require a multinational

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of the forest.

45. *Reforestation*, *supra* note 43, at 289.

46. L.A. Times, Mar. 6, 1989 § I, at 8, col. 2. The foreign ministers of Brazil, Ecuador, Bolivia, Columbia, Peru, Venezuela, Guyana and Suriname met in Quito, Ecuador on March 6-9, 1989 to discuss cooperative measures to stop the destruction of the Amazon jungle (world's largest jungle).

47. Worldwatch Institute, founded in 1974, is a small research organization that aims to encourage a reflective and deliberate approach to global problem-solving. It seeks to anticipate global problems and social trends and to focus attention on emerging global issues. It takes an international approach that reflects the view that solutions to many of tomorrow's problems are not likely to be found within traditional boundaries. ENCYCLOPEDIA OF ASSOCIATIONS 15958 (23d ed. 1989).

48. *Reforestation*, *supra* note 43, at 289.

49. "Desperate" countries are Third World countries, such as Brazil, Madagascar, and Venezuela, who have cut their forests to clear land for agricultural purposes. *Reforestation*, *supra* note 43, at 289.

50. *Id.*; TIME, Oct. 24, 1988, at 72. Applied Energy Services, the builder and owner of a coal-burning plant in Uncasville, Conn., acting on a recommendation from the World Resources Institute, donated $2 million in seed money to a CARE project in Guatemala designed to stave off the climatic crisis by replanting depleted forests. This donation should be enough for 52 million new trees and will eventually absorb a quantity of carbon dioxide that is roughly equal to the amount emitted by the new facility over its life-span (approximately forty years).

51. *Environmental Perspective*, *supra* note 43, at 34.

52. *Id.*

53. The Oak Ridge National Laboratory in Tennessee estimates that to stop the greenhouse effect would take 1.7 billion acres of sycamore trees, which are especially good at soaking up carbon dioxide. This is an area approximately the size of Australia. Ramirez, *supra* note 28, at 107.

54. In an address to the U.N. General Assembly on Sept. 25, 1989, President Bush stated, "[n]o lines on a map can stop the advance of pollution. . . . We must develop an international approach to urgent environmental issues." *Lawyers Convene to Save the*

agreement.

II. INTERNATIONAL LAW OF POLLUTION

Historically, the problems of international pollution control were essentially regional and subject to different treaty agreements.[55] The "grandfather" of international environmental agreements was the Trail Smelter Arbitration between Canada and the United States in 1939.[56]

Other treaties have dealt with pollutants which destroy the ocean,[57] rivers,[58] outer space[59] and air.[60] These treaties were usually between two countries, or at best regional. They were not agreements that affected the entire world.

It was not until 1966 that the concept of addressing the "problems of the human environment emerged in the United Nations General Assembly debates."[61] It took two more years before

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Planet, THE NATIONAL LAW JOURNAL, Oct. 9, 1989, at 32, col. 1 [hereinafter *Lawyers Convene*].

55. J. BARROS & D.M. JOHNSTON, THE INTERNATIONAL LAW OF POLLUTION 70 (1974). An example is the 1909 Boundary Waters Treaty between Canada and the United States.

56. *Trail Smelter Arbitral Tribunal*, 33 AM. J. INT'L L. 182, 191 (1939). Canada assumed liability for the discharge of noxious gases over American territory. Canada agreed to pay the United States $350,000 for the damage caused prior to January 1, 1932.

57. International Convention for the Prevention of Pollution of the Sea by Oil, *opened for signature* May 12, 1954, 12 U.S.T. 2989, T.I.A.S. No. 4900, 327 U.N.T.S. 3, as amended Apr. 11, 1962, 17 U.S.T. 1523, T.I.A.S. No. 6109, 600 U.N.T.S. #32, as amended Oct. 21, 1969, 29 U.S.T. 1205, T.I.A.S No. 8505 (an agreement to prevent the spilling or discharging of oils into the seas). Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, *opened for signature* Dec. 29, 1972, 26 U.S.T. 2403, T.I.A.S. No. 8165, entered into force for the United States Aug. 30, 1975 (An agreement to promote the effective control of all sources of pollution of the marine environment, and to take all practicable steps to prevent the pollution of the sea by the dumping of waste and other matter that is liable to create hazards to human health, living resources, and marine life).

58. Helsinki Rules on the Uses of the Waters of International Rivers, 2 Y.B. INT'L L. COMM'N, 357, U.N. Doc. A/CN.4/SER.A/1974.; Convention on the Protection of the Rhine Against Chemical Pollution, Dec. 3, 1976, 16 I.L.M. 242 (an agreement to improve the quality of the Rhine waters through elimination and reduction of pollution).

59. Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and other Celestial Bodies, Jan. 27, 1967, art. IX, 18 U.S.T. 2410, T.I.A.S. No. 6347, U.N.T.S. 205 (an agreement that the exploration and use of outer space shall be carried out for the benefit of all countries and outer space shall be free for exploration by all States).

60. Agreement on Monitoring the Stratosphere, May 5, 1976, 27 U.S.T. 1437, T.I.A.S. No. 8255 (an agreement to pursue measures to increase the understanding of the stratosphere. Agreed between the United States, France and England). Convention on Long-Range Transboundary Air Pollution, Nov. 13, 1979, 10 I.L.M. 1442 (an agreement between the members of the ECE that they will work to reduce transboundary air pollution, in particular, sulfur).

61. J. BARROS, *supra* note 55, at 73

anything of substance occurred. Finally, in December 1968, the United Nations approved a proposal for a worldwide conference on these problems in Stockholm in 1972.[62]

A. The Stockholm Declaration

The United Nations Conference on the Human Environment met in Stockholm from June 5-16, 1972.[63] The meeting resulted in a document which recognized the differing needs of developed and developing nations. Authorities considered the Declaration to be a guide to nations in the future to protect the international environment.[64] It required States to supply information on developments within their jurisdiction which might have an adverse impact on the environment of other jurisdictions.[65] That document has three parts: (1) seven proclamations regarding the status of man and the environment; (2) twenty-six principles for formulating several key rules of international environmental law; and (3) a strategy for a practical approach to improve the environment (the action plan).[66]

1. Proclamations

The seven proclamations of the Declaration identified the status of and the relationship between man and the environment.[67] The

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62. *Id.*

63. Stockholm Declaration of the United Nations Conference on the Human Environment June 16, 1972, 11 I.L.M. 1416 [hereinafter Stockholm Declaration].

64. *United Nations Conference on the Human Environment*, U.N. Monthly Chron., July 1972, at 50 [hereinafter *U.N. Conference*].

65. *Id.* at 51.

66. Stockholm Declaration, *supra* note 63.

67. U.N. Document A/CONF.48/14 (1972)

1. Man is both creature and moulder of his environment . . . [and he] has acquired the power to transform his environment in countless ways and on an unprecedented scale. Both aspects . . . the natural and the man-made, are essential to [man's] well-being and to the enjoyment of basic human rights.

2. The protection and improvement of the human environment is a major issue which affects the well-being of peoples and economic development throughout the world.

3. Man has constantly to sum up experience and go on discovering, inventing, creating and advancing.

4. In the developing countries most of the environmental problems are caused by under development . . . the developing countries must direct their efforts to development bearing in mind their priorities and the need to safe guard and improve the environment. For the same purpose, the industrialized countries should make efforts to narrow the gap between themselves and the developing countries.

5. The natural growth of population continuously presents problems on the preservation of the environment, and adequate policies and measures should be adopted to face these problems.

6. A point has been reached in history when [man] must shape [his] actions

proclamations recognized the universal requirement for man to have a safe environment.[68] They also recognized that industrialization causes the majority of pollution.[69]

These proclamations reflect the tension between the developing and the developed countries.[70] Developing countries need to provide their citizens with the basics of life: adequate food, clothing, shelter, education and sanitation. Doing this means fully utilizing their natural resources, perhaps in a manner not consistent with recognized environmental standards. Developed nations, according to the Declaration, should take the responsibility to make the differences between developed and developing nations less inequitable.[71]

2. *Principles*

The twenty-six Principles recognized the global effect of pollution. They endorsed and consolidated existing rules of international law. Principles 1, 2 and 6 are relevant to pollution such as carbon dioxide. Principle 1 declared the right of all men to a clean environment: "[m]an has the fundamental right to freedom, equality and adequate conditions of life, an environment of a quality that permitted a life of dignity and well-being. . . ."[72] Principle 2 recognized as *natural* resources of the earth "air, water, land, flora and fauna and especially representative samples of natural ecosystems."[73] Although the Principles did not refer to acid rain, ozone-depletion or the greenhouse effect, Principle 6 states: "[t]he discharge of toxic substances or of other substances and the release of heat, in such quantities or concentrations as to exceed the capacity of the environment to render them harmless, must be halted in order to ensure that serious or irreversible damage is not inflicted

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throughout the world with a more prudent care for their environmental consequences.

7. To achieve this environmental goal will demand the acceptance of responsibility of citizens and communities and by enterprises and institutions at every level, all sharing equitably in common efforts.

68. Stockholm Declaration, *supra* note 63, at 1416.

69. *Id.* at 1417.

70. Developing countries or third world countries comprise two-thirds of the world's population. Inhabitants of these countries have about one-half as much to eat as the average inhabitant of a developed country. They consume merely one-fifth of their energy and put out only 10% of the world's industrial production. Incomes in developing countries are less than 10% of the developed world's average incomes. BRUNNEE, Acid Rain and Ozone Depletion: International Law & Regulation 67 (1988).

71. Stockholm Declaration, *supra* note 63, at 1417.

72. *Id.* at 1417-18.

73. *Id.* (emphasis added).

upon ecosystems."[74]

Principles 1, 2 and 6 contain a consensus of global concern[75] and warrant global agreement about the environment, including the greenhouse effect.[76] Principle 22 recognizes the need for more international control: "States shall cooperate to develop further the international law regarding liability and compensation for the victims of pollution and other environmental damage caused by activities within the jurisdiction or control of such States to areas beyond their jurisdiction."[77] These statements provided the basis for a new type of multi-national agreement, such as the Montreal Protocol.

The traditional approach to solving environmental problems turned on the concepts of territorial sovereignty versus territorial integrity.[78] This concept was embodied in Principle 21 of the Stockholm Declaration which states in part, "[s]tates have . . . the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction."[79] This principle has been adopted in many of the subsequent international agreements governing air, water pollution and the use of international rivers.[80] It reflects the traditional approach of "equitable use" and "responsibility." When two countries share a common resource, such as a body of water, each may use the resource but if one should harm that body of water, that state will be responsible for the damage. This approach is of little use when the shared resource is the atmosphere of the earth and any damage is of an inseparable nature.

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74. *Id.*

75. The Conference heard 141 statements from representatives of the participating countries and of inter- and non-governmental organizations. Participants included 1,200 representatives of 110 countries. Although all members of the United Nations were invited to attend, the USSR and most other Eastern European countries did not participate. U.N. Conference, *supra* note 64, at 54.

76. What skeptics thought would only be a rhetorical statement has become a highly significant document reflecting a community of interest among nations regardless of politics, ideologies or economic status. *Id.* at 53.

77. Stockholm Declaration, *supra* note 63, at 1420.

78. BRUNNEE, *supra* note 70, at 86. According to the principle of territorial sovereignty, a state has the right to use its territory in whatever way it deems suitable, even if such utilization could cause environmental harm beyond its territory. According to the principle of territorial integrity, however, a state is entitled to be free of infringements upon its territory.

79. Stockholm Declaration, *supra* note 63, at 1420.

80. Weiss, *supra* note 3, at 492.

3. *The Action Plan*

The third area of the Declaration was the Action Plan.[81] The broad types of action that make up the plan are: (1) the global environmental assessment programme;[82] (2) environmental management activities;[83] and (3) international measures to support the national and international actions of assessment and management.[84] The basic format of the Action Plan was bolstered by over a hundred recommendations.[85] These recommendations led to the establishment of the United Nations Environment Programme.[86]

B. United Nations Environment Programme (UNEP)

Following the Stockholm convention, the United Nations Environment Programme was established in 1973.[87] UNEP was established to give the Action Plan an institutional and financial backing.[88] UNEP is headquartered in Nairobi and consists of a Governing Council, a small Secretariat and the Environment Fund.[89] UNEP is an advisory body with no executive functions. Its basic task is to coordinate, supervise and stimulate the activities of other United Nations agencies, international and regional organization and national governments.[90] UNEP is also responsible for global monitoring and information systems, education, training and technical assistance.[91] While UNEP itself has no law creating pow-

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81. Stockholm Declaration, *supra* note 63, at 1421.

82. English spelling of word program; used in international agreement. The global assessment programme includes evaluation and review, research, monitoring, and information exchange. Stockholm Declaration, *supra* note 63. The monitoring of changes in the environment is done through Earthwatch, a worldwide surveillance system that collects data, offers information, studies threats to the environment such as chemical pollution, and warns against impending environmental crises. INTERNATIONAL ORGANIZATIONS 248 (1989).

83. The environmental management segment is the goal setting and planning and international consultation and agreements. Stockholm Declaration, *supra* note 63, at 1421.

84. The supporting measures segment include such things as education and training, public information, organization, financing, and technical cooperation. *Id.*

85. The recommendations were specific guidelines for UNEP to follow. They covered areas such as planning and management of human settlements for environmental quality, aspects of natural resources management, the identification and control of pollutants of broad international significance, and recognizing the education, informational, social, and cultural aspects of environmental issues. *Id.* at 1422-64.

86. During the conference it was stated that the Action Plan constituted a turning-point in man's endeavors to preserve and protect his planetary heritage. It was considered revolutionary that the Conference had both approved the establishment of continuing environmental machinery and a fund to give it life. U.N. Conference, *supra* note 64, at 54.

87. Johnston, *supra* note 2, at 257.

88. BRUNNEE, *supra* note 70, at 144.

89. *Id.*

90. *Id.* at 145-46.

91. *Id.* at 146.

ers, it has supported treaty formation between nations.[92]

The Stockholm convention was a significant step towards the recognition that the world has just one environment. Its principles have guided nations in the establishment of various agreements. The establishment of UNEP has created one international body with the ability to assess and monitor the entire environment. UNEP has been instrumental in the initiation of various conferences on the environment and has helped to raise the world's level of consciousness.

III. INTERNATIONAL APPROACH TOWARDS THE CONTROL OF OZONE

Both the problems of increasing carbon dioxide and the breakdown of the ozone layer are global issues. Therefore, in order to address the issue of increased carbon dioxide, it is necessary to look at international agreements concerning other global problems. Ozone is such an issue. The problem was addressed in the recent Montreal Protocol. Therefore, this Comment will explore how such an agreement was met and examine its operation.

A. The Ozone Problem

The ozone layer is located in the stratosphere between ten and thirty miles from earth. This layer is vital to the health of the earth's inhabitants. The layer is comprised of molecules which consist of three atoms of oxygen. These molecules absorb most of the ultraviolet radiation that comes from the sun.[93]

Chlorofluorocarbons (CFCs) are unusually long-lived synthetic compounds made up of chlorine, fluorine, carbon and sometimes hydrogen.[94] They may stay in the atmosphere for as long as 150 years. When the CFC molecules break up, chlorine is released and destroys the ozone molecules by separating one of the oxygen

92. *Id.* at 148.

93. Lemonick, *Deadly Danger in a Spray Can*, TIME, Oct. 2, 1989, at 42; *Heat Waves*, *supra* note 9, at 22-23. Significant adverse effects on human health and the environment include: increased incidence of skin cancer; suppression of the human immune response; possible decreases in the productivity of commercially important crops; possible increases in mortality of commercially or ecologically important aquatic life; and degradation of paints, plastics, and other materials.

94. *Id.* CFCs are nontoxic and inert (they do not combine with other substances). They vaporize at low temperatures so therefore they are perfect as coolants for refrigerators and propellant gases for spray cans. They are also excellent insulators and are used in the production of plastic-foam materials like styrofoam cups. Most importantly, they are simple and cheap to produce.

atoms.

In 1985 scientists discovered a hole in the ozone layer over Antarctica. The size of the hole has grown. There was a sixty percent loss of the ozone layer as of 1987 and the hole was as large as the continental United States.[95]

B. The Montevideo Meeting

In 1981, in Montevideo, Uruguay, UNEP organized a meeting of governmental experts to discuss and identify major environmental concerns in the field of environmental law, with particular regard to developing countries. They identified three "major subject areas" for priority attention and eight other areas with a lower priority. One of the top priorities was the protection of the stratospheric ozone layer.[96]

The depletion of ozone in the stratosphere was also recently addressed by a treaty signed in Montreal.[97] This was the first multinational treaty that prospectively addressed the environment on a global basis,[98] and as such is a model for any future multi-national agreements regarding the environment.

C. Vienna Convention for the Protection of the Ozone Layer

In Vienna on March 18-22, 1985, UNEP held a conference that was a result of the meeting in Montevideo on the Protection of the Ozone Layer.[99] This Convention established general obligations for protecting the ozone layer, obligations for international cooperation on systemic monitoring and scientific and technical assistance, and methods for information transmission.[100] The Convention was opened for signature on March 22, 1985 and signed by fourteen

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95. *A Gaping Hole in the Sky*, NEWSWEEK, July 11, 1988, at 21-22.

96. Law Milestone at Montevideo, UNITERRA, Nov./Dec. 1981. The other top priority areas were marine pollution from land-based sources and transport, handling and disposal of toxic and dangerous wastes. The lower priority areas were (1) international cooperation in environmental emergencies; (2) coastal zone management; (3) soil conservation; (4) transboundary air pollution; (5) international trade in potentially harmful chemicals; (6) prevention of pollution of rivers and other inland waters; (7) legal and administrative mechanisms for the prevention and redress of pollution damage; and (8) environmental impact assessment.

97. Montreal Protocol, *supra* note 4.

98. A more slowly developing problem that has recently come to the international community's attention was not even addressed: the increase in carbon dioxide in the atmosphere and the resulting climate change of the earth.

99. Vienna Convention for the Protection of the Ozone Layer, March 22, 1985, 26 I.L.M. 1516 [hereinafter Vienna Convention].

100. *Id.*

signatories to the Convention.[101] The convention provided procedures for formulating possible control measures.[102] While the Convention was not ratified, it brought the issue of ozone to the forefront and paved the way for the Montreal Protocol.

D. Montreal Protocol

Following the Vienna Convention, the Protocol on Substances that Depleted the Ozone Layer was negotiated.[103] The conference met in Montreal from September 14-16, 1987. The Protocol established specific obligations to limit and reduce the use of chlorofluorocarbons. Fifty-six members of the United Nations attended the conference.[104] The United States and twenty-three other nations signed the Protocol.[105] Article 16 of the Protocol provided that once eleven countries ratified the Protocol, the Protocol would enter into force on the following January.[106] Therefore, as of January 1, 1989 the Protocol was in force.

The Protocol attempts to freeze or reduce the emission of chlorofluorocarbons into the atmosphere. It seeks to accomplish this through a variety of ingenious measures, which makes allowances for the needs of both the developed and developing countries.

For example, in calculating the consumption levels,[107] the Protocol Article 2(1) provides that commencing on the first day of the seventh month following the date of entry into force of the Proto-

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101. By November 5, 1987, the following had indicated ratification, accession or acceptance of the convention: Australia, Austria, Byelorussian SSR, Canada, Finland, Guatemala, Mexico, New Zealand, Norway, Sweden, Ukrainian SSR, Union of the Soviet Socialist Republics, United Kingdom and the United States. The convention has not entered into force since the requirements of Article 17(1) have not been met. These requirements provided for the convention to enter into force after twenty had ratified, accepted, approved or assessed. There were twenty-eight signatories to the convention, but only fourteen approved the final document. Vienna Convention, *supra* note 99, at 1516.

102. *Id.* art. 8, art. 11. Article 8 provides for the possible adoption of future protocols. Article 11 provides that disagreements concerning the interpretation of the Convention should be resolved by negotiation.

103. Montreal Protocol, *supra* note 4.

104. *Id.* at 1544.

105. *Montreal Protocol on Substances that Deplete the Ozone Layer*, 29 HARV. INT'L L.J. 185, n.1 (1988). The signing nations are: Belgium, Canada, Denmark, Egypt, Democratic Republic of Germany, Finland, France, Ghana, Italy, Japan, Kenya, Mexico, Netherlands, New Zealand, Norway, Panama, Portugal, Senegal, Sweden, Switzerland, Togo, United Kingdom, United States, Venezuela, and the European Economic Community. Since then, a total of 32 have ratified the Protocol, and six additional nations indicated on March 5, 1989 they would ratify the Protocol. Those are: Austria, Hungary, Malaysia, Trinidad and Tobago, the Philippines and Zambia. L.A. Times, Mar. 6, 1989, § I, at 1, col. 3.

106. Montreal Protocol, *supra* note 4, art. 16, at 1559-60.

107. "Consumption" means production plus imports minus exports of the controlled substances. *Id.* at 1551.

col, the calculated level of consumption of the controlled substances should not exceed the calculated level of consumption in 1986.[108] However, Article 5(1) provides that a developing country whose annual calculated level of consumption of the controlled substance is less than 0.3 kilograms per capita on the date of the entry into force of the Protocol, may, within ten years of that date, be entitled to delay compliance with the control measures identified in Article 2, paragraphs 1 to 4.[109] The question remains whether the end result will be a decrease in the level of CFCs. With the developing countries able to increase their use, the level of ozone in the stratosphere may not significantly decrease.

Similarly, Article 2(1) provides that "each Party producing one or more of these substances [shall] not exceed its calculated level of production of 1986, *except that such level may be increased by ten percent.*"[110] This was done to "satisfy the basic domestic needs of the Parties operating under Article 5 [developing countries] and for the purposes of industrial rationalization[111] between Parties."[112] Again, there appears to be the question of whether production will actually decrease.

The "freeze" of consumption will occur between 1989 and June 30, 1993.[113] In other words, countries shall not use any more CFCs than they are currently using during that period. Then, between the dates of July 1, 1993 and June 30, 1994, consumption shall not exceed eighty percent of the 1986 level (a decrease of twenty percent).[114] Starting July 1, 1998, the level of consumption shall not exceed fifty percent of the 1986 level.[115] Critics believe that the projected fifty percent reduction is inadequate to prevent additional substantial damages to the ozone layer. They believe that a global reduction of eighty five percent over five years would be required to halt ozone reduction.[116]

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108. *Id.* art. 2(1) at 1552.
109. *Id.* art. 5(1), at 1555.
110. *Id.* art. 2(1) at 1552 (emphasis added).
111. "Industrial rationalization" is defined as the transfer of all or a portion of the calculated level of production of one Party to another, for the purpose of achieving economic efficiencies or responding to anticipated shortfalls in supply as a result of the plant closures. *Id.* art. 1(8), at 1552.
112. *Id.* art. 2(1).
113. *Id.* art. 2(3), at 1552.
114. *Id.* art. 2(3)
115. *Id.* art. 2(4) at 1552.
116. N.Y. Times, Sept. 17, 1987, § A, at 12, cols. 3-4. Statement from the United States Environmental Protection Agency on March 2, 1989, the European Community environment ministers agreed to eliminate CFC production and consumption by the year 2000. L.A. Times, Mar. 3, 1989, § I, at 1, col. 4. And on March 3, 1989, President Bush made the

Research, development, public awareness, and the exchange of information were addressed in Article 9.[117] The Parties were to meet not later than one year after the Protocol went into force.[118] At that meeting, assessment of the control measures was to be discussed[119] and, guidelines and mechanisms for promoting compliance and enforcement were to be developed.[120] Currently the Protocol does not provide a method of complaint, nor a method of enforcement for non-compliance. This is one of the weakest portions of the Protocol. It was to be up to the Parties at their first meeting to agree to some stringent methods of enforcement and penalty.[121] The question becomes whether these measures will have any teeth, given the strength of the World Court.[122]

Moreover, many major users of CFCs, such as China an India, are not signatories to the Protocol and, therefore, are not bound by the provisions.[123] The Parties will have to determine what, if anything can be done other than banning the import and export of controlled substances from, or to, any state not a party to the Protocol.[124]

Both proponents and critics have stated that the success of the Protocol will turn on its economic impact. The production of CFCs

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same proposal. L.A. Times, Mar. 4, 1989, § I, at 15, col. 5.

117. Stockholm Declaration, *supra* note 4, art. 9. British Prime Minister Margaret Thatcher staged a 100-nation conference on the ozone layer in London the week of March 5-7, 1989. The major objective of the conference was to persuade major producers such as India and China to at least sign the Montreal Protocol. L.A. Times, Mar. 3, 1989, § I, at 15, col. 5.

118. Stockholm Declaration, *supra* note 63, at 1557-58.

119. *Id.* art. 6, at 1556. At that meeting, representatives from 86 countries stated that they favored a total ban on CFCs by the end of the century. TIME, May 15, 1989, at 63.

120. *Id.* art. 8, at 1556. At the Helsinki meeting an accord was developed which calls on industrialized countries to create a U.N. fund that would help the developing countries adapt to life without CFCs. How that was to be accomplished was not specified, but Norway's Environment Minister Sissel Ronbeck announced that Norway would contribute 0.1% of its gross national product, or about $88 million, if others would do the same. TIME, May 15, 1989, at 63.

121. The first meting was set for May 1989 in Helsinki, and first on the agenda was the consideration of ways to toughen the agreement. L.A. Times, Mar. 3, 1989, § I, at 15, col. 5.

122. The International Court of Justice was established in 1945. It is only open to States, not private individuals. The Court has jurisdiction only when the States consent to have a dispute heard by the Court. The Court is seated in the Hague, Netherlands. There are 15 judges who are elected by the U.N. General Assembly and the Security Council. There are two parts to each case: written and oral. A Judgement is final and without appeal, but a party can ask for an interpretation of the judgment as to its meaning or scope. The Court can also give advisory opinions. The problem is there is not way to enforce the decision. OSMANCZYK, THE ENCYCLOPEDIA OF THE UNITED NATIONS AND INTERNATIONAL AGREEMENTS 403 (1985).

123. L.A. Times, Mar. 8, 1989, § 1, at 6, col. 4.

124. Montreal Protocol, *supra* note 4, art. 4(1) and (2), at 1554.

is a major industry, valued at roughly $2.2 billion dollars.[125] The Protocol should have an immediate impact on the availability of CFCs, making them more expensive to consumers. The cost of the research and development of alterative products will also have to be born by consumers and the market place.[126]

The Montreal Protocol is the "state of the art" agreement among many nations. While it is filled with inconsistencies, loop-holes, and enforcement difficulties, the Montreal Protocol, the London meeting, and the Helsinki[127] meeting provide a foundational framework for future action. The Montreal Protocol demonstrates that multinational agreements, meeting the needs of both developing and developed nations, can be drafted to confront a global problem.

IV. Comparing and Contrasting the Control of CFCs with the Control of Carbon Dioxide

Both CFCs and carbon dioxide are gases. Both are emitted into the air and rise in the atmosphere. By entering the atmosphere, the resultant effects of these gases cause indivisible harm. CFCs are causing depletion of the ozone layers over the polar caps,[128] and carbon dioxide is causing dramatic changes in the world's climate. Here the similarities between the two gases end.

CFCs are synthetic products, imported and exported in the world market place. It is possible to identify where they are produced and used, and therefore it is possible to control them. Every nation and every person produces carbon dioxide. Carbon dioxide is the by-product of the consumption of natural resources. There is no single, identifiable source of emission. Therefore, the control of the emission of carbon dioxide is going to be particularly difficult.

The major source of carbon dioxide has been and still is, the industrial nations. The Third World countries rightfully blame these countries for the problem.[129] For them, the solution lies with those

125. N.Y. Times, Sept. 17, 1987 § A, at 1, col. 3. The EEC accounts for about 40% of the world CFC production; the U.S. about 30%; the USSR about 12%; Japan 10%; and the rest of the countries about 10%.

126. *Id.*

127. *See supra* notes 117 & 119.

128. L.A. Times, Mar. 6, 1989, § I, at 8, col. 3.

129. Prime Minister Robert Mugabe of Zimbabwe and Prime Minister Rajiv Gandhi of India spoke during the Assembly debate on the report of the World Commission on the Environment and Development (Brundtland Report). Both pointed out that affluent countries play a large part in world environmental damage, through their release of gases that damage the ozone layer, acid rain, nuclear accidents, and radioactive wastes. Gandhi stated that, although the poor were the main victims of environmental damage, they had little responsibility for any of it, since it was mostly caused by large-scale "commercial exploitation."

countries which have caused it. This problem was addressed in the Montreal Protocol by having different levels of control for developing countries and developed countries.[130]

The disparity of resources between industrial nations and those of the Third World creates an inequity in the abilities of the Third World countries to pay the price for the industrial nations' abuse. Those emerging countries are trying to develop and feel that constraints upon that development are unwarranted. Therefore, they are going to be reluctant to agree to any such restraints, as evidenced in their reluctance to sign the Montreal Protocol.[131] However, the problem must be addressed by both developed and developing nations.

The Montreal Protocol allows consideration for both developing and developed nations needs.[132] However, when considering the carbon dioxide problem, there cannot be double standards for different nations.[133] Perhaps the efforts of the developed countries will be towards one goal, decreasing emissions, while the efforts of the developing countries will be towards another, reforestation. A worldwide decrease in the emission of carbon dioxide accompanied by an increase in the amount of acreage planted with forests would be an equitable solution.

Also, the graduated decrease negotiated in the Montreal Protocol cannot work with the problem of carbon dioxide.[134] An immediate decrease in the emission of carbon dioxide must occur. The United States is going to have to take a leadership role in the decrease of carbon dioxide emissions.[135] If they decrease the production of carbon dioxide significantly, the effect would be significant. After all, only four groups produce over seventy-five percent of the carbon

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Environmental Perspective, *supra* note 43, at 36.

130. *See supra* notes 104-06 and accompanying text. Developed countries must freeze consumption levels while developing countries may delay compliance for ten years. Similarly, for the production of CFCs, developed countries must freeze production levels while developing countries can *increase* production by 10%.

131. L.A. Times, Mar. 3, 1989, § I, at 15, cols. 4 & 5. Developing countries have been reluctant to agree to cuts for fear their budding industries will suffer and they will be dependant on the West of CFC substitutes.

132. Montreal Protocol, *supra* note 4.

133. *See supra* note 106 and accompanying text.

134. *Id.*

135. L.A. Times, Mar. 8, 1989, § I, at 29, cols. 1 & 2. EPA administer William K. Reilly, in a report to a Senate environmental subcommittee, stated that the United States should take the lead in meeting the problem of global warming by example. He stated the U.S. must cut consumption by increasing the average automobile fuel economy to 40 m.p.g. by 2000, making new single family homes more energy efficient, and setting fees on carbon dioxide emissions.

dioxide.[136] They are going to have to commit to resolving the problem by applying the identifiable principles of reduction, while the emerging countries apply the principles of prevention.

The carbon dioxide problem could possibly be solved by a similar type of agreement as the problems with chlorofluorocarbons. However, it is a problem of far greater complexity and magnitude and much more intractable than that of chlorofluorocarbons. For one thing, with CFCs, control can be reached by developing a substitute. The control of carbon dioxide will require major changes. It is going to take an innovative approach to solve this international environmental problem, and many of the concepts contained in the Montreal Protocol are going to have to be revised or discarded.

V. Innovative Approaches

Any multi-national agreement negotiated to resolve the greenhouse effect is going to encroach on long held concepts of equitable use, territoriality and sovereignty.[137] These concepts will have to be expanded, destroyed or revised if pollution is to be controlled.[138]

The concept of equitable use,[139] as far as the polluting of the atmosphere, has to be discarded. There can be no equitable use of the atmosphere. All peoples and all nations are users of the atmosphere, and it must remain intact for the generations to come.[140]

The concept of territoriality[141] has no place in any consideration of the atmosphere. The atmosphere is everyone's resource, and therefore, each nation must act to maintain the integrity of the atmosphere. Nations must recognize that the air space over their country, in terms of environmental pollution, is not within their

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136. *Weiss*, *supra* note 3, at 491.

137. *See supra* note 76 and accompanying text.

138. Seven countries, Canada, England, France, Italy, Japan, the United States and Germany have scheduled a meeting to be held April 17-21 1990 in Italy at Abbey of Ponpignano. The purpose is to "consider the need for a digest of existing rules and to give in-depth consideration to the legal aspects of environment at the international level." *Lawyers Convene*, *supra* note 54, at 32.

139. *See supra* note 78 and accompanying text. In a meeting sponsored by the Canadian Government in Ottawa in February, 1989, 80 legal and policy experts met. They drew up an outline for a "Law of the Atmosphere" which begins with the idea that "[s]tates have the *obligation* to protect and preserve the atmosphere." *Lawyers Convene*, *supra* note 54, at 32-33 (emphasis added).

140. L.A. Times. Mar. 8, 1988. § I, at 6, cols. 1-6. Mostafa K. Tolba, executive director of UNEP closed the London conference on the environment March 7 by stating, "[w]e speak euphemistically of the Third World. But what this conference has so dramatically demonstrated that there is only one world: a world without a common history but facing a common future."

141. *See supra* note 76 and accompanying text.

control. The atmosphere has no identifiable boundaries. Even developing nations have to realize that the continued destruction of the balance between the various atmospheric gases and the heat of the earth have far reaching effects.

The concept of sovereignty will need to be revised. Each nation has the right to exploit the resources within their jurisdiction,[142] however, they also have the responsibility to prevent harm to those out of their jurisdiction.[143] In the highly technical world of today, ideas of sovereignty are contracting. Each nation is going to have to relinquish some of their sovereignty for the benefit of the world.[144]

The solution will involve individual effort, national commitment, international cooperation and the expenditure of money. Also, the industrialized nations are going to have to assist the developing countries in meeting their needs. This will require not only assistance in material goods but also economic assistance.

Economic assistance need not be the traditional lending of additional monies to the Third World countries.[145] The approach must be innovative and offer developing countries an incentive to comply with agreed upon standards.[146] A country could buy a discounted

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142. *Id.*

143. *Id.*

144. The "Law of the Atmosphere" referred to in note 139 includes an elaborate new system of international cooperation that would include: (1) each nation making an account of what goes on within its borders and opening its "condition of the air" books to be audited by the international community; (2) creating standards of liability and compensation as well as other relief to deal with violations; and (3) handling disputes first by negotiation between the countries in disagreement then by arbitration, and finally by judicial settlement at the international court of justice. *See Lawyers Convene, supra* note 54, at pg. 32, col. 1.

145. The World Wildlife Fund has developed an innovative means to help curb deforestation and other environmental problems through a technique called "debt-for-nature swapping." This is done by the acquisition of debt by conservation organizations, at a discount from current holders of the Third World country's debt, and its redemption in local currency to be used for conservation purposes. One U.S. dollar of acquired debt can yield the equivalent of several dollars worth of local currency. Since the early 1980s, institutional lender banks have been willing to sell high-risk debts at substantial discounts. To date, such programs have been implemented in Ecuador, Argentina, Costa Rica, Bolivia and Venezuela. However, such programs can take place only if the diverse interests of all the potential actors can be addressed. WORLD WILDLIFE FUND LETTER 1-(Vol. 1, 1988). Also, EPA chief William K. Reilly recently announced a $1 million grant to support a "debt-for-nature" swap aimed at helping to preserve the tropical forests in Madagascar. It is the first such swap financed by the federal government instead of international agencies. L.A. Times Aug. 4, 1989, § I, at 7, cols. 1 & 2. The proposed "Law of One Atmosphere" establishes a World Atmosphere Trust Fund to help developing countries comply with any standard created. *Lawyers Convene, supra* note 54.

146. L.A. Times, Mar. 11, 1989, § I, at 1, cols. 3 & 4. Treasury Secretary Nicholas F. Brady outlined a new plan to offer debt-reduction as an incentive to coax debtor countries into taking steps to encourage more investment and saving at home and to stem the drain of capital to investments overseas. The plan would allow the countries to buy up discounted loans either by swapping portions of its debt for equity or through other financial schemes.

loan by agreeing to plant a specific number of trees or by building power plants that produce less carbon dioxide. The World Bank and the International Monetary Fund could also use their leverage to promote development that produces less carbon dioxide.

A new system of international responsibility and burden-sharing to sustain the Earth and its people must be devised. The United Nations must immediately establish a committee to devise an approach to resolve the increased atmospheric carbon dioxide, similar to the Vienna Convention in 1985.[147] The problems of increased carbon dioxide transcends the issues of national sovereignty and territoriality. International standards of emission controls will have to be set, complied with, and monitored. This could cause an encroachment upon national boundaries, but the current world atmosphere of international concern and agreement regarding the environment should enhance its acceptance.

A sharing of developing technology will have to be accomplished. No longer can a nation afford to hold secret, or only sell, those developments which can help the whole population of the earth.[148] Perhaps some type of debt relief can also be tied into the sharing of new technology.

Awareness of global responsibility for all peoples of the Earth has evolved and must be enlarged.[149] Executive Director of UNEP, Mostafa K. Tolba stated, "[w]e have affirmed our intention to declare a truce in our assault on the atmosphere."[150] And, Prime Minister Thatcher stated, "[f]or centuries, mankind has worked on the assumption that we could pursue the goal of steady progress, without disturbing the fundamental equilibrium of the world's atmosphere and its living systems. In a very short space of time, that

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147. The U.N. Conference on Human Environment, currently being referred to as "Stockholm II", has been planned for 1992 and it is expected that a reassessment of all major environmental problems facing the world will occur. *Lawyers Convene*, *supra* note 54, at 32.

148. L.A. Times Mar. 8, 1989, § I, at 6, cols. 1-6. China and India have asked for an international fund financed by developed countries to help less developed countries switch to safer chemicals (regarding CFCs). Also, Tolba of UNEP challenged industry to make the new chemicals available at costs comparable to those charged for CFCs.

149. Louis Sohn, Professor of International Law at Georgia University Law School and author of a chapter on environmental law in an American Law Institute's restatement of the law, noted that a higher level of international cooperation is being envisioned because whatever happens in one country, such as Brazil, affects all other nations simultaneously. And John Lawrence Hargrove, Executive Vice President of the Washington, D.C.-based American Society of International Law observed, "[t]he new globalism of environmental problems raises interesting questions of expanding legal responsibility." *Lawyers Convene*, *supra* note 54, at 33.

150. L.A. Times, Mar. 8, 1989, § 1 at 6, col. 1-6.

comfortable assumption has been shattered."[151] The nations of the world must come together in recognition of the grave challenge that is facing the planet.[152]

CONCLUSION

The Montreal Protocol was an important step in confronting the problems of the environment on an international platform. The actual Protocol, the subsequent meetings about strengthening the Protocol, and the increasing international awareness of environmental pollution have set the stage for more comprehensive international environmental agreements. Developed and developing nations must agree to solve the problem of increasing carbon dioxide. The solution will involve compromises on both sides. However, the earth's atmosphere is global, and all citizens of the earth must participate in protecting the environment.

Margot B. Peters

151. *Id.*
152. Speth, *supra* note 1, at 17.